

Great Lakes Water Levels and Coastal Impacts 2020

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CSS Inc on contract to NOAA Office for Coastal Management



Great Lakes Water Levels: Current

MARCH 2020

New record high mean water levels were set in lakes Michigan/Huron, St. Clair, and Erie.

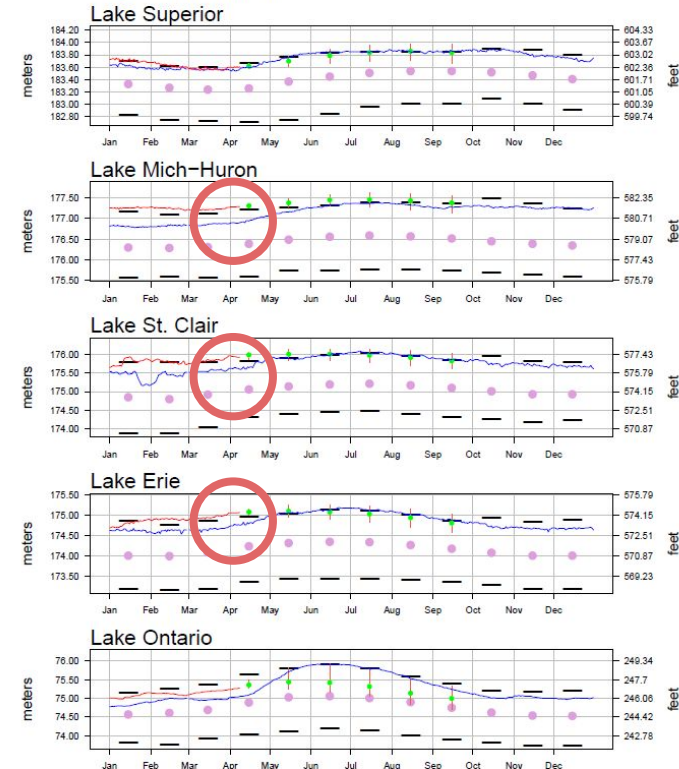
Superior was shy by 1.57 inches
Ontario was shy by 7.48 inches

Source: US Army Corps of Engineers



Daily Great Lakes Water Levels

— 2020
— 2019
● Coordinated Forecast
● LTA Monthly Mean
— Record High/Low Monthly Mean



Lakewide average levels are based on a network of water level gages located around the lakes.
LTA and record levels are computed from a period of record of 1918 to 2019.
Elevations are referenced to the International Great Lakes Datum (1985).

Updated 2020-04-09



Great Lakes Water Levels: Inputs and Outputs

Note all basins except Lake Ontario had an increase in precipitation for March 2020

Note all basins are close to or above 100% of their average precipitation for the year

Source: US Army Corps of Engineers

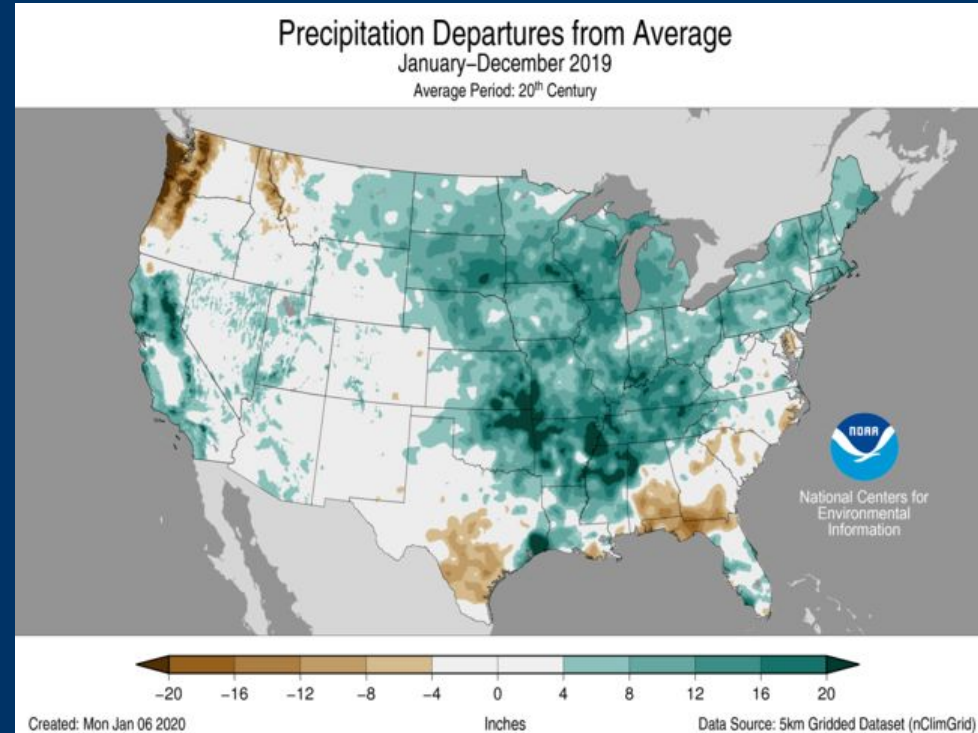
PRECIPITATION (INCHES)								
BASIN	March				12-Month Comparison			
	2020	Average (1900-2017)	Diff.	% of Average	Last 12 months	Average (1900-2017)	Diff.	% of Average
Superior	1.78	1.73	0.05	103	29.67	30.59	-0.92	97
Michigan-Huron	2.74	2.13	0.61	129	34.51	32.52	1.99	106
Erie	3.35	2.76	0.59	121	37.32	35.55	1.77	105
Ontario	2.51	2.68	-0.17	94	36.57	35.83	0.74	102
Great Lakes	2.51	2.17	0.34	116	33.75	32.76	0.99	103

LAKE	March WATER SUPPLIES ¹ (cfs)		March OUTFLOW ² (cfs)	
	2020	Average (1900-2008)	2020	Average ³ (1900-2008)
Superior	103,000	46,000	84,000	66,000
Michigan-Huron	265,000	183,000	251,000	172,000
Erie	76,000	72,000	274,000	197,000
Ontario	92,000	75,000	336,000	238,000

Great Lakes Water Levels: Inputs and Outputs

Wet across much of the
Central US

Year to Date Precipitation
Departure from Average





Water + Wind

Lake Superior Water Levels: Storm Impacts

AN ANGRY LAKE SUPERIOR

Today through This Evening

Highest Wind Gusts Today (mph)



GALE WARNING

- Gale-force winds and near storm-force gusts today through this evening.

IMPACTS

- Isolated tree damage and power outages near the lake.
- Flooding, erosion, and damage to shoreline.
- Difficult travel for high-profile vehicles on high bridges between Duluth and Superior.



NATIONAL WEATHER SERVICE DULUTH, MN

weather.gov/duluth

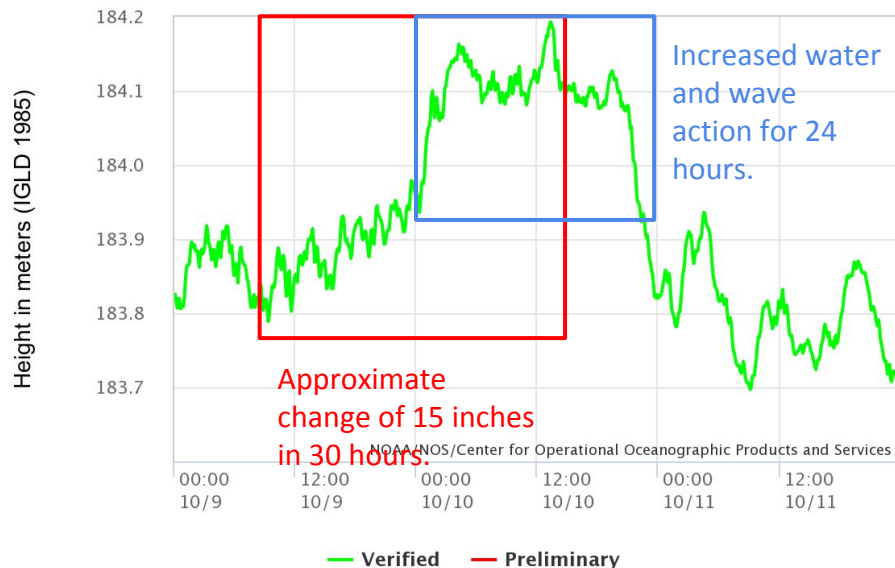


Published on: 10/10/2018 at 6:58AM

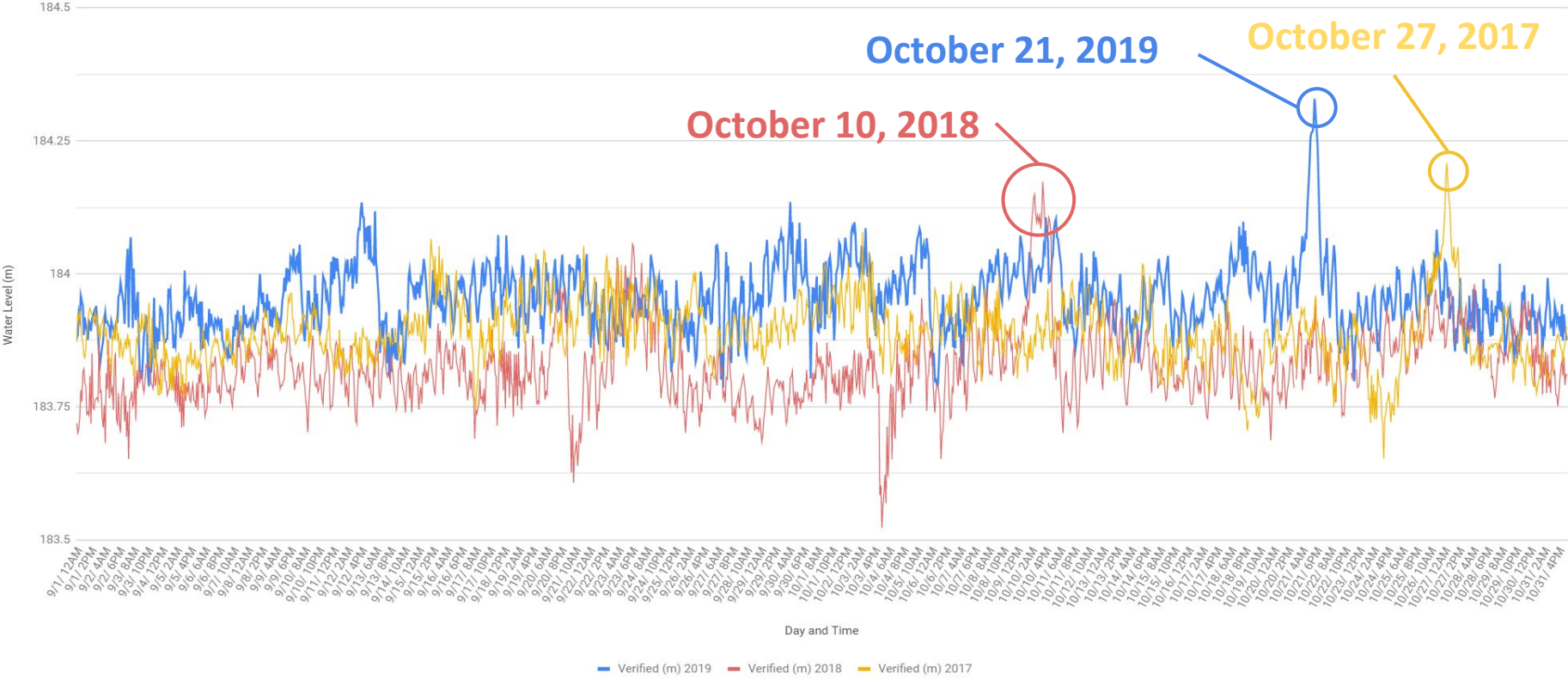
NOAA/NOS/CO-OPS

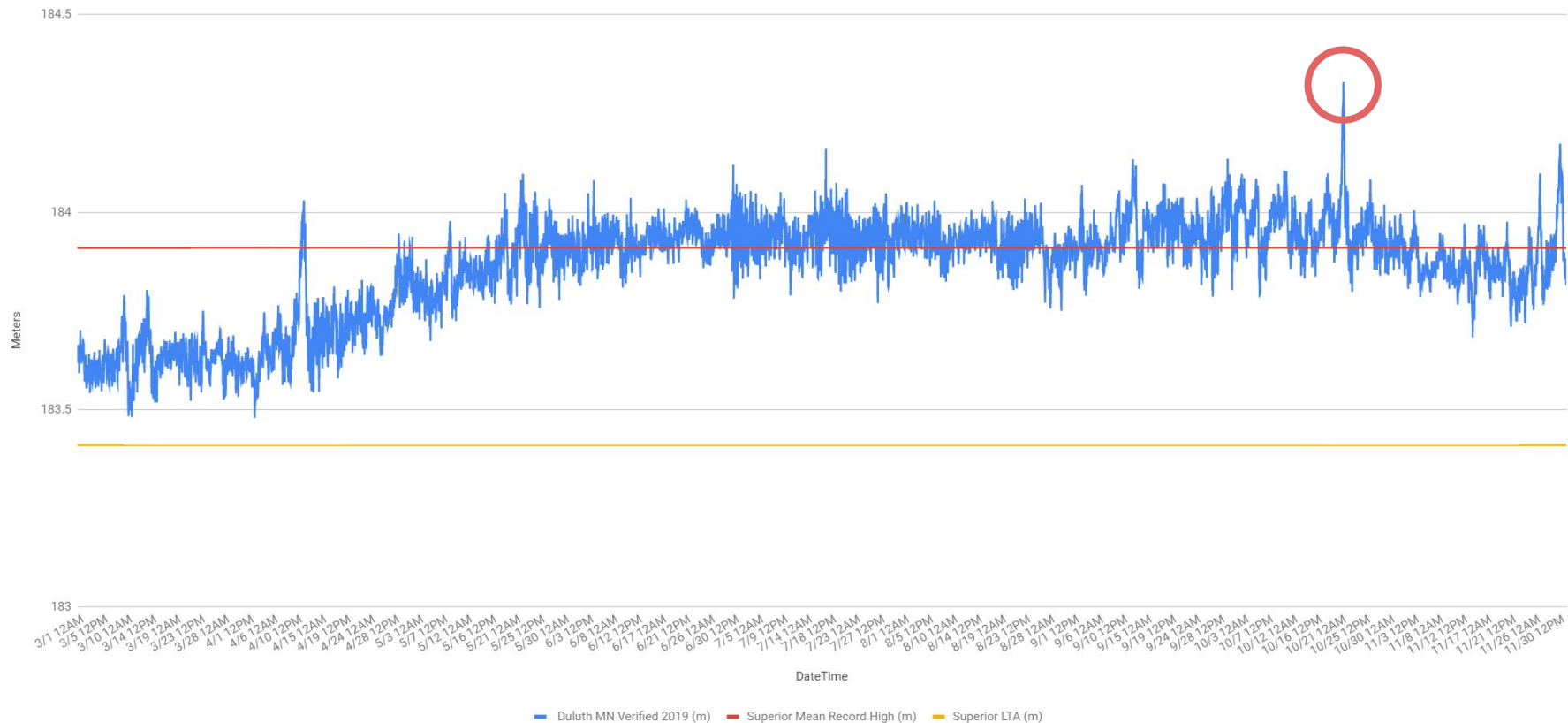
Observed Water Levels at 9099064, Duluth MN

From 2018/10/09 00:00 LST/LDT to 2018/10/11 23:59 LST/LDT



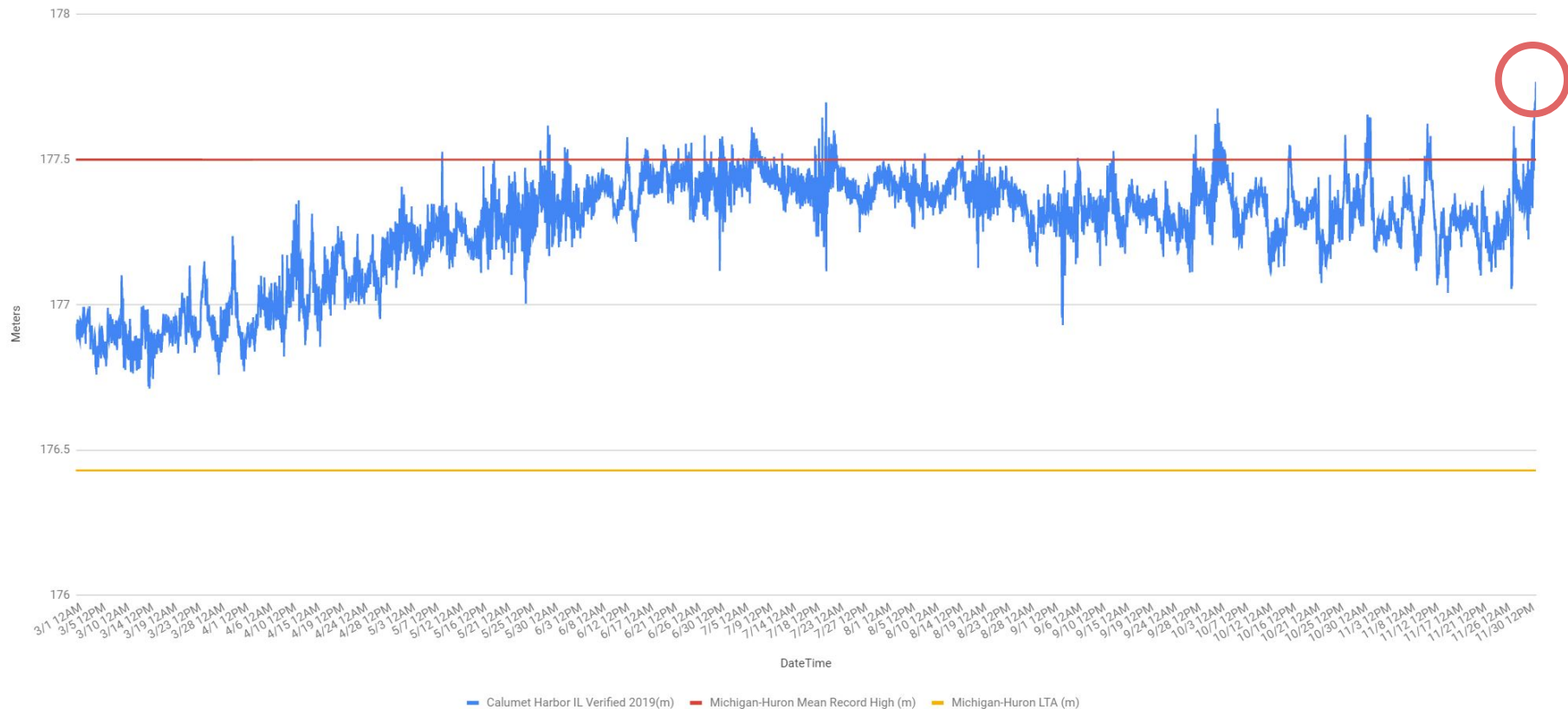
Comparison of Water Levels and Storm Events - Duluth, MN 9099064

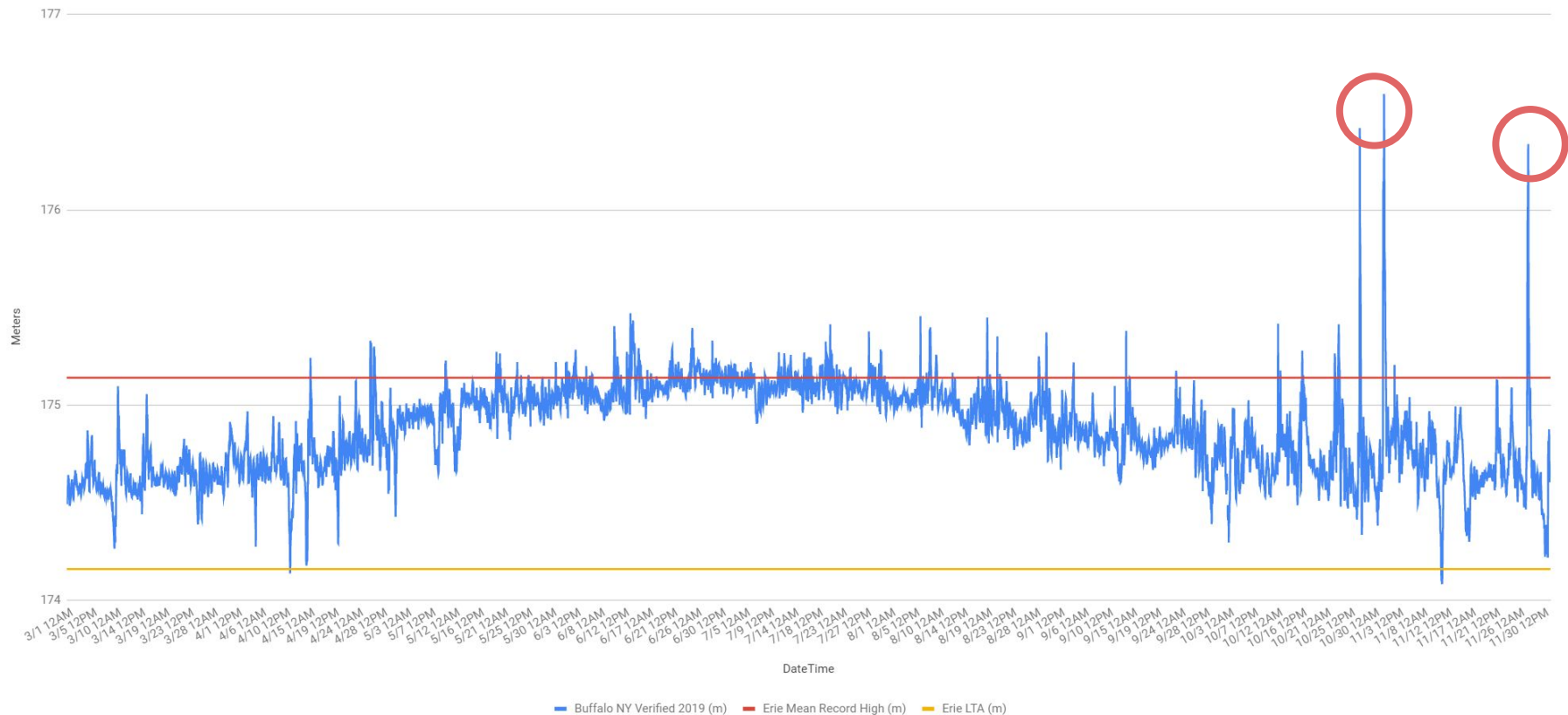




IGLD 1985

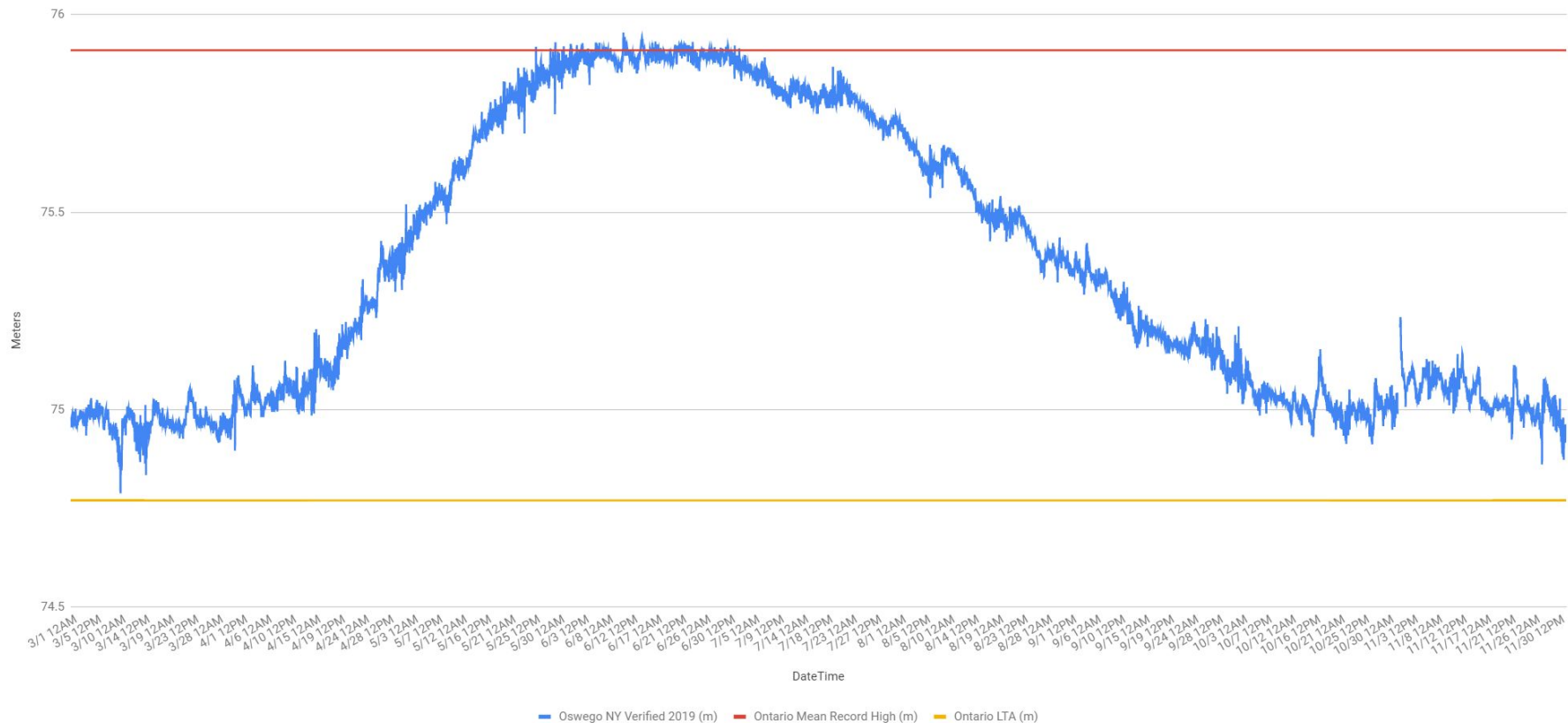






IGLD 1985





IGLD 1985

Great Lakes Water Levels: Coastal Impacts

- Shoreline Erosion
- Increased sediment transport in the littoral zone
- Alterations to stream and river mouths
- Damage to coastal infrastructure
- Flooded marinas and docks
- Hazards to navigation
- Loss of coastal terrestrial and wetland habitat
- Shrinking beaches for recreational use
- Increased impacts when storms move through
- Damage and loss of private property



Brighton Beach, Duluth, MN



Illinois Beach State Park

Coastal Erosion

Impact to coastal wetlands

Littoral sediment transport

Red - erosion

Blue - deposition



Ontario Beach Park, Rochester, NY



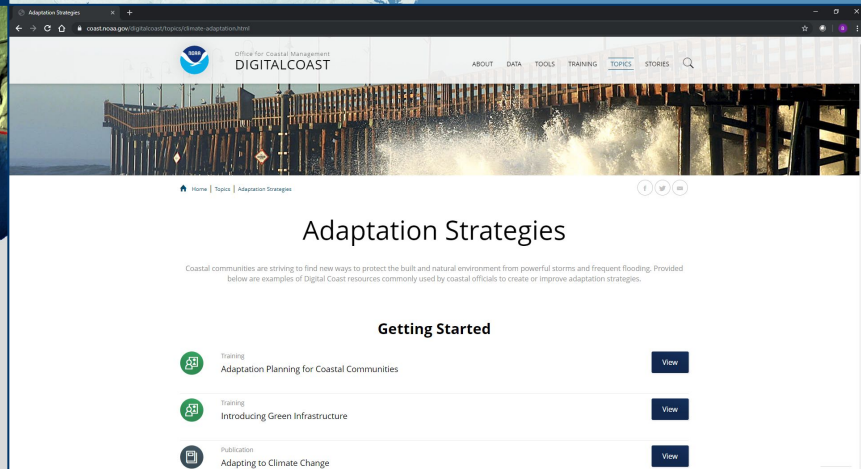
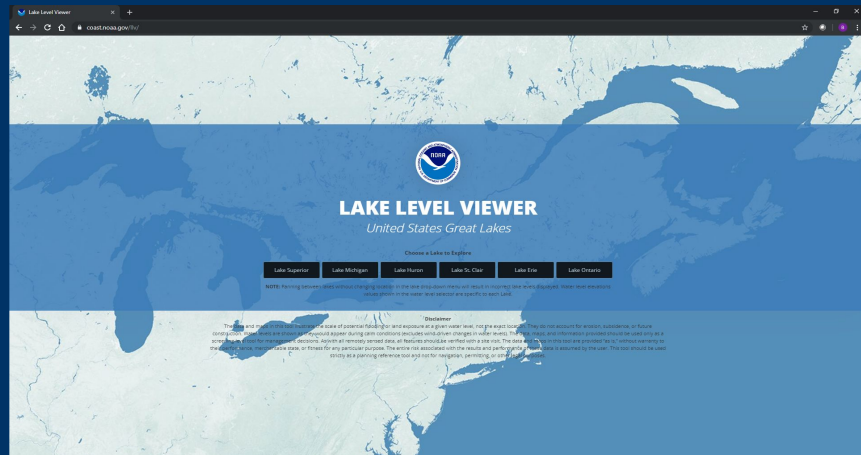
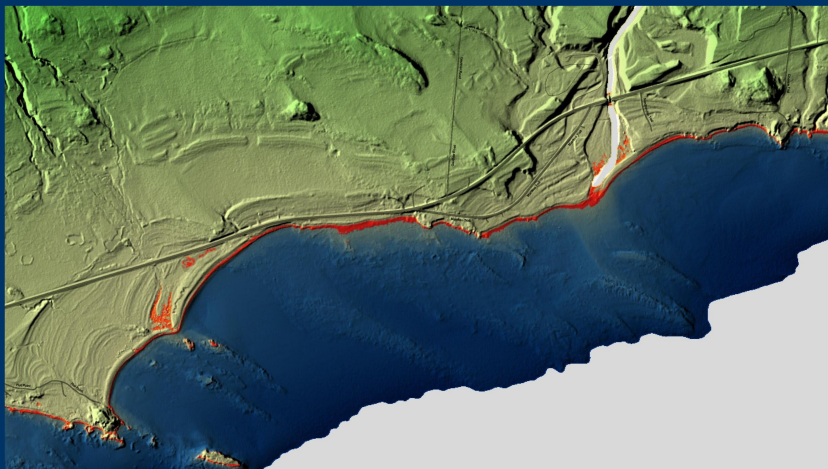
June 14, 2019



Digital Coast

Data, Tools, Trainings, and Resources

<https://coast.noaa.gov/digitalcoast/>



Office for Coastal Management



Duluth, MN

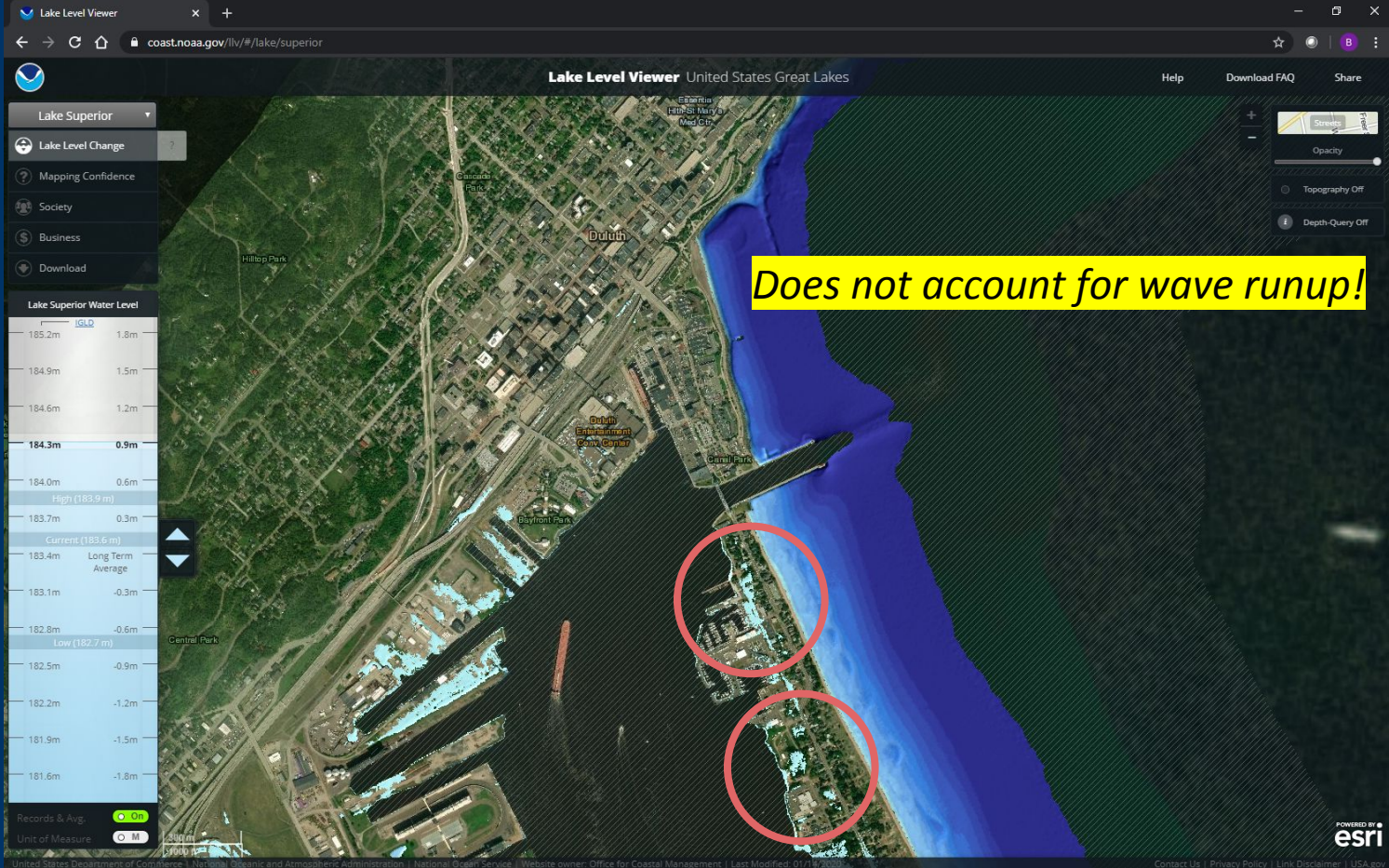
10/21/2019 4PM

184.33 meters
604.75 feet

LTA

183.41 m
601.74 ft

Difference
+0.92 m
+3.02 ft



Office for Coastal Management



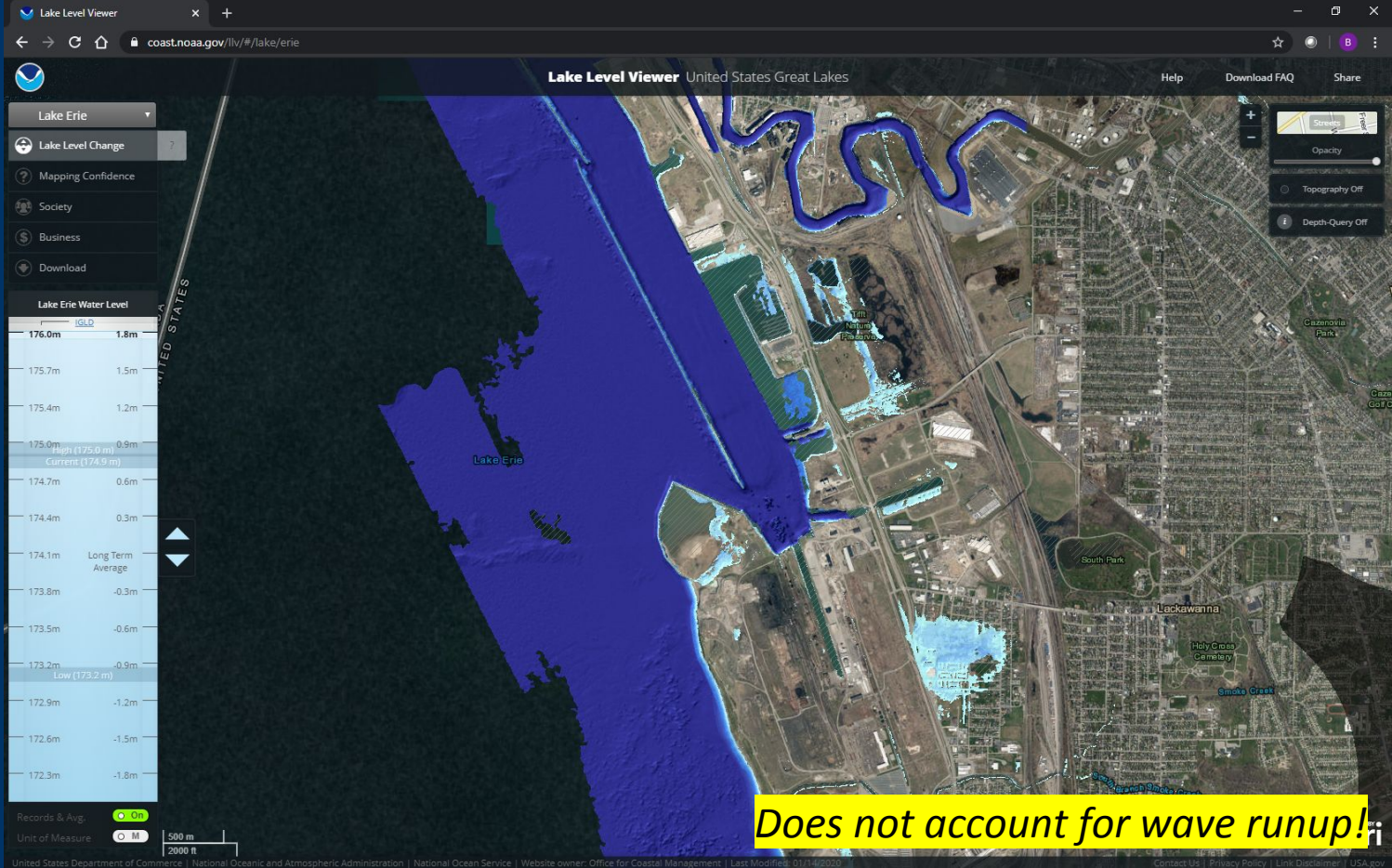
Buffalo, NY

11/1/2019 12AM

176.59 meters
579.36 feet

LTA
175.14 m
574.6 ft

Difference
+1.45 m
+4.76 ft



Does not account for wave runup!



Great Lakes Coastal Zone Management Programs



Contact Information

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